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ISGG: Cooperative Mission in the AI Era

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Abstract. At the 21st International Conference on Geometry and Graphics (ICGG2024, August, 2024), an international panel was organized with the Institutional Members and Associated National Organizations of ISGG to discuss cooperative mission in the AI era and its relation to the International Society for Geometry and Graphics. This is a summary of the discussion with the panel members Luigi Cocchiarella (Italy), Liang-Yee Cheng (Brazil), Michal Zamboj (Czech Republic), Hans-Peter Schröcker (Austria), Hongming Cai (China), Eva Wohlleben (Germany), Stefano Bertocci (Italy), and Hirotaka Suzuki (Japan).

Key Words: cooperative mission, AI era, geometry, graphics, International Society
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Figure 1: World map showing the distribution of Institutional Members and Associated National Organizations of ISGG. Cover slide of the meeting.

1 Introduction — Luigi Cocchiarella (Chairman, International Society for Geometry and Graphics)

As the President in Office of ISGG (2021–2024), I have been glad to open the 2nd Plenary Meeting of the Institutional Members and Associated National Organizations of ISGG during the 21st International Conference on Geometry and Graphics – ICGG2024, last August 7th, 2024, at the Kitakyushu International Conference Centre, in Kitakyushu, Japan.

The 1st inaugural Meeting was held during the online Conference ICGG 2022, organized in Brazil.

The worldwide distribution of the Institutional Members and Associated National Organizations being, or having been, affiliated with the ISGG, and contributing to its growth over about almost fifty years, is shown in Figure 1, while their updated list is published on the ISGG webpage at: `https://isgg.net/membership/`.

ISGG – Cooperative Mission in the AI Era, was the topic proposed to the audience this year, with two main questions posed to the discussants.

The first question was: *What is the task of the Scientific Societies nowadays?*

Compared with the past, Scientific Societies are no longer the Alma Mater for scientists and scholars, neither they have any direct academic power, as it was in former time, just think of the *Accademia dei Lincei* for Galileo Galilei, the *Royal Society* for Isaac Newton, the *Académie des Sciences* for Christiaan Huygens and Antoine-Laurent de Lavoisier, the *Berlin Academy* for Gottfried Wilhelm Leibniz, or the *Manchester Literary and Philosophical Society* for James Prescott Joule, since today we have the Universities [1]. However, the identity of both Scientific Societies and Universities is mostly based on the same three pillars, that is, *Research, Education, Publications,* although with different goals. Indeed, one might say that Universities have the task of "making" research, education, and publications, while Societies

have at most the task of "connecting" Universities, and of course any interested individual or institution, which is enormously facilitated nowadays, thanks to the Internet and the Social Media. In this perspective, ISGG should act as a *worldwide Hub,* taking advantage of its digital network, and the human network behind it, which is to be considered in the light of the overall mission of our Society, as it is stated in the ISGG bylaws:

> "The objective of the Society is to foster international collaboration and stimulate scientific research and teaching methodology in the fields of geometry and graphics. To pursue its objectives the Society shall seek to:
>
> 1. foster geometry and graphics technology transfer;
> 2. enhance the quality of graphics and geometry education of designers, engineers, and geometricians, through international co-operation;
> 3. co-operate with international agencies and corporation;
> 4. sponsor international conferences, seminars and symposiums in graphics and geometry;
> 5. establish sponsored research and funding mechanisms;
> 6. seek membership from graphics and geometry organizations and individuals".

In order to achieve the mission, it is to be considered how to match the points listed above on a global scale. In fact, we can already act on some levers and channels, while other levers and channels remain to be built. Concerning the permanent enhancements of the quality of graphics and geometry education, we can already benefit from the good opportunities offered by the current Erasmus Programmes worldwide, as well as by other educational international projects, like double degree programmes, summer schools, team-teaching agreements, and so on. Apart from the ICGGs, promoting local and/or international conferences, seminars, symposia, and offering ISGG patronages having ISGG members in the boards, is something that we can do, although we do not have the power to sponsor. On the other hand, cooperating with international agencies and corporations, and with local governmental or cultural institutions, is for now something still to be built. But fortunately public institutions and authorities somehow need consultations with experts, to enhance and innovate research, education, and professions. Another challenging point is fostering geometry and graphics technology transfer, something that we might activate with appropriate partners, stakeholders and investors. A similar situation concerns sponsored research and funding mechanisms. Maybe we will have more possibilities if our reputation will become more visible. That is, the scientific level of the ISGG matches the boxes that those who can fund research normally require, but they hardly know about our activities as well as we often don't know what the other ISGG members are doing, and this lack in connection, prevents us to cooperate on relevant collaborative projects. As one can see, all the points listed in the statement of the ISGG mission, including that of seeking memberships, be it individuals or organizations, from which our survival depends at the end, highlight the need to enhance our communication channels, not only every two years with the occasion of the ICGGs, but keeping them active permanently. By the way, looking at the world map in Figure 1, there are important Countries not yet involved in the ISGG community. It is clear, that the responsibility of all this, cannot lie with the Elected Board (President, Vice-Presidents, Treasurer) and the Appointed Board (Directors) only, requiring more energies to capillary work at the global level. That's why we need to cooperate with our Institutional Members and Associated National Organizations. As a primary stage, we should agree on sharing info about research and education opportunities worldwide ("what" is worth sharing), and about the most appropriate communication strategies to do this ("how"

to share it effectively), if necessary, organizing designated *ad hoc* working committees to help the Board in this job.

Another relevant part of the ISGG mission is the dissemination of knowledge, as again the ISGG bylaws remind us:

> "The Society shall promote the publication of international journals, books, software, manuals and conference proceedings in geometry and graphics".

On this point ISGG is quite well equipped, since we have an official review indexed in the SCOPUS records, the *Journal for Geometry and Graphics* where also this article is printed, publishing two issues per year, and the *ICGG Proceedings,* published every two years with the occasion of *The International Conference on Geometry and Graphics — ICGG.* However, it is also necessary to provide for a wider and day-by-day sharing of our scientific outcomes, to be selected among the most excellent books, articles, and innovative manuals related to Geometry and Graphics research and education, to make them consultable on the web. In the future, targeted translations in English of excellent contributions published in other languages should be provided as well, to take benefit of the long tradition of studies carried out around the world in our field. As well as interactive and updatable textbooks may be included. In fact, that of the publications may work as one of the most powerful levers to testify the scientific level of ISGG, increasing through this way our attractiveness. For this reason, during the ICGG 2024, we decided to immediately start making visible, on the ISGG Membership webpage, some key publications of the Institutional Members and Associated National Organizations of ISGG published in English, which are now already visible. An ongoing process, which needs further encouragements.

The second question posed was: *How can we deal with Geometry and Graphics in the AI era?*

As we saw in the Opening Ceremony of ICGG 2024, since the Conference was organized for the first time, a great attention was constantly, obstinately paid, to recognize and take care of innovation in the growing field of Geometry and Graphics, especially during the long transition from the Analogue to the Digital era. For decades, indeed, the Conference Topics have been more, or less, slightly or heavily adapted accordingly [2].[1] This was the challenge promoted and faced by our founding fathers, documented in more than thirty volumes of *Proceedings* (since 1978) and about thirty issues of the *Journal for Geometry and Graphics* (since 1997). Well, now it is time for us, the second, third, and further generations of members, to take care of keeping our Scientific Society up to date with the ongoing changes. As we know, there is a new pervasive challenge nowadays, which is up to us to face and manage, that of the transition from the Digital to the Artificial Intelligence era. Then, we may start from some simple food for thought. First of all, we may consider our expected position in the field of AI. As we know, AI has been developed over more than fifty years, based on the implementation of a refined technology, that is almost impossible for any individual to control. In this sense, its "backend" is a kind of unknown black box for majority of the people. On the other hand, we all are dealing with AI every day, be it a conscious or unconscious *liason.* But its "fronted" is a kind of interface for us as users, with the risk to became mere "prompters" if we do not have the appropriate background and critical awareness to formulate inquiries in

[1]The Opening Lecture of ICGG 2024 was related to the article [2], the slides have been published on the Conference webpage at: `https://www.icgg2024.jp/html/program/download/icgg2024-Cocchiarella-Opening.pdf`.

front of the AI, and to interact with it, which seems to act as a "tool", and sometimes as a "partner".

Since we don't want to become mere prompters, we might somehow take inspiration from ancient philosophers, who taught us that the origin of knowledge comes from asking appropriate questions. And in fact, the first form of knowledge was Philosophy. Philosophers asked themselves questions about the astonishing Nature they had in front. Now, also the abundance of Data mined and elaborated by the artificial intelligence shows in front of us. Then, from the side of the user, a critical wisdom is required, to select questions to ask, and to understand answers upon the questions asked. As well as to find appropriate strategies to train AI by answering questions, which somehow takes us back to philosophy again, namely to the Socratic practice of "maieutics". In this process, the complexity level of semantics managed by AI, integrating written, graphic, numerical languages, sounds and other, requires both disciplinary, and holistic sensitivity, as well as creativity, claiming for a wider approach to knowledge, including not only science and techniques, even in the field of Geometry and Graphics. It seems that we have to enlarge our field of studies, and this may have an impact on the future Conference Topics of ICGG, where contributions from humanities are also expected to be included.

However, back-end and front-end are strongly connected in AI, because technical implementation and users' inquiries are both part of the machine learning cycle, as well as of the advancement of our human learning. Some Universities are already at work, including my home University, the Politecnico di Milano, where research on AI started in 1973, and now an AI-based App is under development to support students in education. Then, despite the incomparably increase of complexity behind it, we should aim at understanding and mastering both the sides of AI. On the purpose, fostering our international cooperation through research and education projects and publications concerning AI in relation to Geometry and Graphics, would be of invaluable help. Taking advantage of the *web,* we may share scientific literature, virtual test spaces, and the expertise of pools of researchers and teachers in the various branches of the wide field of Geometry and Graphics.

After this introduction, the discussion started.

2 Statements

2.1 Hirotaka Suzuki (Japan Society for Graphic Science)

My name is Hirotaka Suzuki and I am the chairman of Japan Society for Graphic Science. AI is not my field. So, this is only my private ideas and not authorized by Japan Society for Graphic Science. Then I would like to show my ideas. I think there are two possibilities or directions in the field of geometry and graphics for AI.

One is image understanding with technique of deep learning. Now we can easily detect some specific objects even in movie, not still image. In future AI will enable us to understand everything or every movement in 3D world with visible ray. I mean not infrared or ultraviolet or laser. Understanding will help control of machine or facilities which have strong relationship with our daily life. In the field of illumination engineering, control technique with image processing is already introduced to deliver light luminous power to appropriate place at appropriate time. In the future, we will have much more comfortable and convenient life with image processing technique and the field of geometry and graphics will be able to contribute much.

And the second is creation. There are much more people who would like to become a designer, artist, composer or something like that. To become such person, ability of evaluation and ability of sense and technique are required. If we have only ability of evaluation, it is a little bit difficult for them to become a creator. However, if AI can produce thousands of works and a person can select distinguished work from the thousands of works, then he may become a good creator with help by AI. Of course, AI can evaluate the works produced by itself and AI itself may become a good creator. But now I'm talking about people who would like to become a creator. I'd like to put aside the possibility. As for I know there are problems of copyright or originality or similarity. I explained only the possibility of AI. Thank you.

2.2 Liang-Yee Cheng (Brazilian Association for Graphics Expression)

My name is Liang-Yee Cheng from University of Sao Paulo, Brazil. On behalf of Professor Braviano, the president of the Brazilian Association for Graphics Expression (ABEG), I'm representing the ABEG. We prepared a text, and I would like to read it to preserve its original words.

Our association, which celebrated its 60th anniversary last year, has been working with ISGG for approximately 20 years. It brings together professors and students who work in the field of graphic expression in teaching and research activities at all levels of education. We are engineers, architects, designers, artists, mathematicians, that is, people working where graphics expression can be applied, including the professionals of graphic education. Every two years we organize in Brazil the International Conference on Graphics Engineering for Arts and Design. We call it GRAPHICA, which is in its fifth edition, and with the patronage of ISGG, it was planned to be held in the city of Pelotas, south of Brazil, in November of this year. However, due to an extreme climatic event that caused a severe flood in the region and affects badly its infrastructure, the event was postponed to May 2025. Nevertheless, the proceedings are planned to be published without delay.

Just a note, I think Luigi mentioned a very important point, a channel communication of ISGG. A point I would like to make is that we will request a space in GRAPHICA 2024 to present the ISGG. This is because most of the attendees of GRAPHICA are gathering in the national association, but they have few information about the international associations.

Since 2013, we issued the Brazilian Journal of Graphic Expression (RBEG). It publishes a new edition every six months and the articles can be written in Portuguese, English, or Spanish. So that it could serve as an excellent international exchange platform. In 2021, a special issue with invited articles written by the members of ISGG was published. It was a very successful initiative and has a very positive impact on fostering the internationalization of the Brazilian community. Here we would like to express our gratitude to the authors for their valuable and on-time contributions. Based on this fruitful experience, we are planning to publish a new issue in 2025 following the same lines, extending the invitation to all active members of ISGG. The details will be announced later after the approval of the editorial committee on the journal.

Finally, we intend to maintain and expand this cooperation with important international societies working together to bridge international cooperation in favor of the fields of Geometry and Graphics.

And just another observation, in this edition of GRAPHICA, we also included the theme of AI. What we observe is that we are reaching a new community and new people that may

be collaborating with us and expanding our public. Also, regarding the Brazilian Journal of Graphic Expression, the intention from the recent experience was to follow the journals from the Italian and Chinese association and to provide an option for platform for international collaboration.

2.3 Michal Zamboj (Czech Society for Geometry and Graphics)

Thank you very much. I'm from the Czech Republic. I'm here on behalf of the Czech Society for Geometry and Graphics. And again, these giant societies as you have seen, Czech society is quite small and closed. There were also some problems for us to find information because we were just reconnecting somehow. We are trying to probably state new things in our society. But we still have our conference. Since we are quite small, we joined forces with the Slovak Society for Geometry and Graphics. We are close together, and the conference that we are organizing is altering each year in Slovakia and the Czech Republic. For Czech society, we have only proceedings, but Czech society is also a partner of the Czech Union of Mathematicians and Physicists, which has quite a long history. So we are a sub-community in there. Our society is quite small, and it does not have many publications to share with you. But we also invite a lot of people to the conferences, and we would be very glad if you could join us at these conferences. And that's probably all for the society.

Considering the AI and also the ISGG hub, these are huge challenges. For these smaller communities the ISGG hub or the idea to communicate this way would be very nice and very important because we also have problems as we are a small community. We have problems joining others everywhere. We don't have some kind of research labs in geometry and such things. Because since we are so small that's kind of a problem. And that would probably be the aim that Prof. Cocchiarella wanted to state. Regarding AI, I think that's a huge question. We will only see what is going to happen anyway. But I would like to see it as a tool, not that much as a partner, but as a tool for communication. Because we might have computers that helped us as some kind of tool, but now we still have problems representing our ideas on synthetic geometry. So I like to draw a lot, I like to create with my hand with geometric objects. And now, what AI could do is transmit these ideas into the representation for computers. So I guess we will have much less coding in computer graphics and in geometry and maybe we would have to be much more creative then and to ask AI for questions and ideas. So thank you and I'm passing the word.

2.4 Hans-Peter Schröcker (Österreichischer Fachverband der Geometrie)

Hello, my name is Hans-Peter Schröcker. I'm representing the Austrian Society whose German name doesn't really translate to Society for Geometry and Graphics but still this is what it is about. It's also a bit of a special society in the sense that its members are mostly teachers at high school level. But it also includes university teachers and also teachers from other schools and people from other fields. But basically it is very much school-centered, which distinguishes it from the other member societies. It's quite big by Austrian standards. It's also very, very active, mostly in education. The society issues a journal in German language which nonetheless might be interesting. It has a searchable website[2] and is openly accessible via the internet, including prior all issues. The Austrian society also organizes a yearly conference,

[2]https://eplus.uni-salzburg.at/ibdg

which formally is not a conference, even if it feels very much like it. It is a further education event for teachers, therefore subject to some special procedures concerning registration and other things. Of course, again, it is in German.

I myself am quite relaxed concerning artificial intelligence and if I observe this society whose opinion I should represent here, I think it's also quite relaxed. As Michal, I see AI rather as a tool than as a partner. A very powerful and versatile tool, maybe a tool that interferes with a lot of things, so that it will be present in many ways and will certainly change many, many things and be disruptive in many aspects, but still a tool that has to be used and we are learning how to use it basically among other tools. The Austrian society does not ignore this development so it's a topic for the forthcoming conference in November. There will be a talk about teaching in the AI era, in the presence of big data and also in the presence of pupils that have been raised in a different way, that behave in a different way, that use modern media in a different way, and how all of this will affect the teaching and where we have to go with this. There will also be a podium discussion on this topic.

In this context, I really would like to share with you something that's not AI but it's related to AI and its basics: The fundamentals of AI are data. There is a project going on in teaching and education which is not formally run by the society but by very active and important members of the society. It is a collection of open, online spatial ability assessments, handcrafted by experienced members from this Austrian society that have years of experience in teaching descriptive geometry and have a very good education and foundation in that. Its URL is `https://www.rif4you.eu` and you can find more information in [3], an article by Günter Maresch who leads this project and reports on some of the data obtained. The idea is that teachers, be it at school, be it at university, can register classes there and the classes then according to a certain scheme can take sets, one set or several sets of spatial ability test assignments and the teacher will then see results and can draw conclusions from this. Of course one of the aims is to collect data of all participants but not for commercial purposes and not for advertisements but for research so that we can see distribution among age, scores among age groups, scores among females and males or depending on educational background or whatever. I think it's a very interesting project which now expands to other countries. It has been translated into English certainly, into Spanish I believe, maybe some other languages as well. So if you are interested I would invite you to join this. Günter Maresch, the head of this project is a very approachable person, you can just send him an email and he usually will answer in short time and provide helpful information. I guess it might also be interesting for him and the other members to connect to people who have experience, past experience in assessing outcomes of graphics education or geometry education using tests. The whole project would certainly profit a lot from more input from experienced researchers from all over the world. So this is what I wanted to share with you. Thank you for listening, thank you for coming. I'll pass on the microphone.

2.5 Hongming Cai (China Graphics Society)

Good afternoon I'm Hongming Cai from China Graphic Society. On behalf of Professor Gang Zhao, I want to share AI-driven digital textbook today. Digital book is a good resource both for on-site education or verbal-based learning or all kind of learning and education. It is a good resource because it has three characters.

First it integrates text, graphics, imaging, video, sound, animation and other materials into one body. So it is richer than just the paper textbook. Second it's interactive. We

can use the textbook to interact between human machine between student and teacher and other interactions. Third the digital textbook is dynamic and flexible. Based on some cloud computing platform or just a mobile tablet we can learn or modify or update the teaching or learning material at any base at any time. This is flexible. We find AI technology could make the digital textbook more powerful. We can integrate more AI algorithm into the textbook. Sometimes we can use content generation method to generate some content just based on the different students or teacher and then we could use big language models to guard the interaction to make the interaction more efficient or powerful. In fact we could make some teaching or education assistant to help teacher or help students to deal with technology language or text to speech, speech to text and other material transformation. Professor Baoling Han and Dr. Xiao Luo are making some digital textbook nowadays. Maybe next time they can show some achievement in AI. We also seek for some cooperation between different education of the students. Maybe we can make the digital textbook in AI more powerful, more efficient.

2.6 Eva Wohlleben (German Society of Geometry and Graphics)

Good afternoon. My name is Eva Wohlleben and I am representing the German Society of Geometry and Graphics. In our society there are fewer teachers than in the Austrian society. Instead, the members are university researchers from the fields of architecture, mechanical engineering, and fine arts. I am one of the artistic researchers in the field of geometry.

We have some publications in book form, from 2007, 2013 and 2015, on the topics of "Geometry, Art and Science", "On Form and Structure" and "The Basis of Diversity – Geometry as a Foundation and Stimulus for Thought". The next conference will take place in Dresden in March 2025 on the topic of "View and Abstraction".[3]

According to AI: From my point of view, it is a great gift that we got this, because it relieves us of tasks that already bore us, such as recombining texts and images that already exist. It frees up human capacity to become visionary. Rather than continuing down the well-worn paths of the past, humans will be free to anticipate what will be needed in the future — which in a lively and moral way is something that we can do and AI cannot.

A major challenge lies in the fact that we are used to the smooth image surfaces of computer design, which become even more detailed with AI, also more frictionless and impenetrable. It takes courage to move away from these smooth and highly detailed surfaces and make something that is more of a sketch: To make something that is bumpy, created in a specific situation and has a signature. It doesn't seem to look that good. But it encourages communication and collaboration.

Especially in teaching, it is a challenge to get young people to accept something preliminary as a valid statement. That is why in the German Society for Geometry and Graphics we always accompany its conferences with a well-funded competition to honor the three-dimensional, haptic model that — with the least material and technical effort — realizes a new geometric idea, a surprise, an impulse to think ahead.

[3] https://tu-dresden.de/mn/math/geometrie/lordick/schnittstelle/veranstaltungen/tagungen-1/abstraktion-anschauung-2025/programm

2.7 Stefano Bertocci (Unione Italiana del Disegno)

Good afternoon, my name is Stefano Bertocci, and I am representing the University of Florence. I also serve as a representative of the Unione Italiana del Disegno, a major national association of academic professionals in the scientific field of Drawing of Architecture, with over 400 members from all across Italy. In Italy, the role of scientific associations for academics is crucial, particularly because these associations influence the laws and policies enacted by the government. Therefore, the rules and guidelines set by our association play a significant role in shaping the academic system in Italy. Each year, we organize a number of scientific conferences, and this year marks the 45th edition of the international conference sponsored by the Unione Italiana del Disegno. All of the scientific papers presented undergo a peer-review process. I would like to share a bit about our community and the role we play as consultants for Italy's ministry policies.

Our association operates at the intersection of scientific technology and the social and humanities sciences, focusing primarily on documentation for restoration work, historical technical documentation, and everything related to the documentation and diagnostics analysis related to preservation of historical architectural, urban, and landscape heritage. Our areas of interest also extend to architectural design, engineering, digital technology, and digital graphics.

The three primary fields of our activity — architecture, engineering, and design — are at the core of our focus, alongside landscape cultural heritage, which is an important topic for our community. We also emphasize archaeology, creative industries, and the cultural sector. In addition, we are deeply involved with graphics, informatics, multimedia languages, and scientific foundations.

Another key activity of ours is digital architectonical surveying, particularly digital scanning, photogrammetry, and other techniques that help with morphological and thematic analysis, critical interpretation, modeling, prototyping, and visual communication. These areas are central to our scientific work.

Our association also publishes scientific journals. One of our most well-known and oldest publications is the Review "Disegnare e dei Immagini", which is now in its 66th edition and classified as a top-tier scientific journal. Additionally, we have a newer publication, "Diségno", which is currently in its 14th edition. We also organize annually several scientific symposiums, and I am responsible for the international relations symposiums. This year, we are holding our 7th such international symposium.

As an Italian, I would like to emphasize the importance of history, especially in the context of the shift from traditional drawing methods to digital technologies. This transition is critical, and in our association, we have established a commission focused on preserving historical drawings. We maintain two types of archives: one for educational purposes, which is particularly relevant to architecture and engineering universities, and one for historical documents, such as the archives of institutions. For instance, I presented in the present conference a study on the historical archives of the Teatro della Pergola in Florence.

Every institution in our network holds its own historical archive, and this is essential for the preservation of our collective memory especially in the field of history of Architecture and technology, and for the urban development history. The digitalization of these archives is crucial, as it enables us to safeguard information for future generations. While the digital era poses new challenges, particularly regarding the conservation of digital data, it is equally important that we continue to protect and maintain these archives, especially when it comes to historical drawings and representations. Thank you for your attention.

3 Conclusion — Luigi Cocchiarella (Chairman, International Society for Geometry and Graphics)

There was not much to add to this round of statements, and to the open discussion that followed, only few words about the main outcomes, to conclude the meeting.

First of all to thank the discussants and the audience for their generous and inspiring contributions and participation, allowing us to highlight the following points.

We agreed on the relevance of the human creativity, which in relation to Geometry and Graphics, seems even more reconfirmed in the AI era.

We agreed on the fact that a new pervasive innovation is coming, which will deserve the highest attention in the future, and an interdisciplinary approach including and integrating even more humanities and science.

We agreed on the fact that the wide spectrum of topics promoted by our Scientific Society in the sector of Geometry and Graphics, can offer the right stage to a wide range of reflections about how to face the new cultural turn.

We agreed on the fact that the next ICGGs could be excellent occasions to reflect on the transition from the Digital to the AI, as well as the former ICGGs have always done, over about fifty years, during the transition from the Analog to the Digital.

We agreed on the idea of managing to have a pool of experts to refer to in relation to research, education, and (why not) professional opportunities and challenges, probably starting from inviting some outstanding profiles among the ICGGs' and JGG's authors and reviewers, and of course, other relevant profile or research groups.

We agreed on the idea of reconfirming the relationship with our "origin", by celebrating in the United States both the 50th anniversary of the ICGG series, and the 100th anniversary of the Engineering Design Graphics Division (EDGD) of the American Society for Engineering Education (ASEE), organizing the first Conference in 1978, with the occasion of the 23rd International Conference on Geometry and Graphics – ICGG 2028.

We agreed on the opportunity to intensify the worldwide engagement of individuals and organizations in the ISGG activities, paying special attention to the Countries with which we do not yet have relations, as they are bearers of specific cultural traditions and approaches in the field of Geometry and Graphics.

We agreed on the opportunity to give visibility to the most relevant publications of the Institutional Members and Associated National Organizations of ISGG on the Membership webpage of the ISGG website.

We agreed on the opportunity to create a repository to preserve the archive of the ICGG, that is, the more than 30 volumes of the Proceedings published up to now.

We agreed on the fact that the ISGG should be active not only with the occasions of the ICGGs, but permanently.

We agreed on the fact that the Board of Regents of ISGG has the task to give permanent inspiration and impulse to the realization of the ISGG mission.

We agreed that the Board of Regents of ISGG can be supported by working committees, participated by invited members of ISGG, appointed "ad hoc" on specific tasks, and balanced to equally represent our three world regions: Asia / Australia / Oceania, Europe / Near East / Africa, North America / South America.

We agreed on the opportunity to confirm the face-to-face plenary meeting with the Institutional Members and Associated National Organizations of ISGG in the program of the next International Conferences on Geometry and Graphics.

We agreed on the opportunity to organize online meetings with the Institutional Members and Associated National Organizations of ISGG also in the period in-between ICGGs.

We agreed on the need to enhance our communication channels, mainly our ISGG webpage, hopefully including Social Media, in order to provide an efficient "metaspace" to our *worldwide ISGG HUB.*

Contributions

The transcript of the podium discussion was produced by Hirotaka Suzuki and Kensuke Yasufuku.

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